

Editorials

Standardisation Efforts to Measure Greenhouse Gases and 'Carbon Footprinting' for Products

SETAC Europe LCA Steering Committee (http://www.setac.org/htdocs/who_intgrp_lcaSC.htm) *

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Recently, due to concerns over climate change, a variety of stakeholders have called for ways to measure greenhouse gas (GHG) emissions associated with consumer products (goods and services). Several approaches for 'carbon footprinting' (CF) are under discussion. The background of activities around CF can be seen in searching for simplifications of Life Cycle Assessment (LCA) to assess a large number of products in a short time frame. The LCA Steering Committee of the Society of Environmental Toxicology and Chemistry Europe (SETAC Europe LCA SC) acknowledges the importance of simplified and practical methods. However, the SETAC Europe LCA SC also wants to express its concern that oversimplified methods may misguide stakeholders on the environmental implications of products and services and thereby lead to counterproductive results for the environment. This is especially true in case the evaluation is limited to a single indicator and disregards other potential environmental impacts. If results are to be communicated to non technical audiences, e.g. consumers, special care needs to be taken to guard against potentially misleading communications.

Do we need a new standard on greenhouse gases and carbon footprinting for products?

The SETAC Europe LCA SC notes the current differences in carbon footprinting approaches. The situation regarding CF resembles that of the discussions around LCA in the late eighties and early nineties with several approaches being proposed which might or might not lead to a similar result depending on the chosen methodology. In the UK, the Carbon Trust™ together with the UK Government Department for Environment, Food and Rural Affairs (DEFRA) are sponsoring the British Standard Institute (BSI) to develop a Publicly Available Specification (PAS 2050) for the measurement of the embodied greenhouse gases (GHGs) in products and services to come to an agreement on the method. There seems to be a benefit to the harmonization of different approaches and the SETAC Europe LCA SC acknowledges the importance of addressing GHG emissions on a product/service level in a consistent way.

However, with the existence and experience of various ISO standards, we are in a very different situation today compared to the early stages of development of LCA guidelines. Therefore, the SETAC Europe LCA SC wonders whether there is the need to embark on a new standardisation effort or whether clear reference to the existing ISO standards would not be sufficient to address the aspects of greenhouse gas emissions originating from products and services on a global level. As existing ISO standards, we are referring here especially to:

- LCA: ISO 14040 and 14044
- GHG emissions originating from product and services are covered by the ISO LCA standards and their potential impact on climate change is seen as a key indicator in LCA alongside other environmental indicators of relevance. Both life cycle inventories and life cycle impact assessment for greenhouse gases are well established and broadly accepted. Today, GHG impacts from products/services are routinely covered in LCAs. Measuring GHG of a CF of a product should not deviate from existing and well accepted ISO standards on LCA.
- ISO 14025 'Environmental labels and declarations – Type III environmental declarations' Critical aspects on the communication of LCA results are described in the ISO 14025 on Environmental Product Declarations (EPD), and need to be taken into account to ensure comparability of results within product categories. The SETAC Europe LCA SC would like to stress that the functional unit approach is crucial to the enabling of comparisons between different products that fulfil the same function on a common basis. Other measures such as mass or volume are not sufficient for comparisons, particularly if the same function can be achieved by very distinct means, e.g. disposable versus reusable products. Another crucial learning from EPD systems is that the relevant stakeholders need to agree on methods and rules that ensure comparability between calculations and results. Without such agreement within the relevant industry, in EPD called 'Product Category Rules', results achieved by different parties may not be compared against each other as they may be based on different assumptions and data.
- ISO 14064-3:2006 'Greenhouse gases, Specifications with guidance for the validation and verification of greenhouse gas assertions' GHG emissions at the company or facility level are captured in a different set of ISO standards (e.g., in ISO 14064:1–3, providing guidance for the validation and certification of GHG assertions). The Greenhouse Gas Protocol – 'A Corporate Accounting and Reporting Standard' released from the World Business Council for Sustainable Development (WBCSD), together with the World Resources Institute, provides further helpful guidance on measuring and reporting GHG from a facility and company perspective. It also encourages evaluating the entire value chain for major GHG emissions.

Looking at the suite of guidance available to people interested in measuring and evaluating GHG impacts of products or services, the SETAC Europe LCA SC holds the view that the existing ISO standards are sufficient to address the environmental

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impacts due to GHG emissions from products/services in a consistent and comprehensive way.

However, in case overriding considerations let it seem to be appropriate to have a separate ISO standardisation effort for GHG emissions from products and services, experts with the SETAC Europe LCA SC want to be constructively engaged and contribute to their development.

Key requirements for any potential new product related GHG standardisation effort

The SETAC Europe LCA SC would like to ensure any new GHG standard is consistent with and gives appropriate reference to a) existing ISO standards covering the GHG emissions and its potential impacts on the environment and b) existing ISO standards covering communication aspects of environmental performance of products.

An important learning from the experience with the ISO LCA standards is that it seems crucial to not separate the intended use of (CF) results from the guidance on how the numbers are to be calculated. To a large degree, the intended use and target audience will determine the required scope as well as the level of detail in data gathering and modelling. Also the extent of the required reporting and the critical review process will depend on communication aspects. As described in the ISO 14040/44 on LCA, different levels of communication need to be taken into account up to 'comparative assertions disclosed to the public', which describes an environmental claim regarding the superiority or equivalence of one product versus a competing product. Comparing CF numbers for different products fulfilling the same function in public can be regarded as a kind of an environmental claim of superiority or equivalence of one product versus a competing product if no other environmental information is provided simultaneously.

The SETAC Europe LCA SC would like to emphasize the importance of the following aspects which need to be addressed by any standard on GHG emissions on a product/service level in so that a new standard is not in conflict with existing relevant ISO standards:

1. **Coverage of relevant environmental impacts.** For product categories and services that have known, or assumed to have, significant environmental impacts other than GHG emissions, those other potential impacts should not be disregarded. These should be covered in a LCA complementing the GHG assessment to avoid problem shifting from GHG to other relevant environmental areas of concern, e.g. related to water consumption, waterborne emissions or summer smog.
2. **Functional Unit approach.** If GHG assessments are to be used for comparisons between different products or services, an appropriate functional unit needs to be defined to ensure that comparisons are made on a common basis, i.e. to achieve an 'apples to apples' comparison as much as possible.
3. **Coverage of life cycle stages.** The GHG assessment should cover all stages of the lifecycle in a comprehensive way. Decisions to omit specific life cycle stages, such as use or disposal, can only be made on a case-by-case basis and based on a good understanding of the relevance of the various life cycle stages. If GHG assessments are to be used for comparisons between different products, all life cycle stages have to be included unless they are identical for all evaluated products.
4. **Coverage of greenhouse gases.** The GHG assessment should cover all relevant greenhouse gases in a comprehensive way.

Decisions to omit specific greenhouse gases can only be made on a case-by-case basis, and based on a good understanding of the relevance of the various greenhouse gases. If GHG assessments are to be used for comparisons between different products, all greenhouse gases have to be included unless the omissions have an identical impact on CO₂ equivalents for all evaluated products.

5. **Required level of detail depending on the use of the study.** If GHG assessments are to be used for communications to third parties on comparisons between different products or services, an appropriate level of detail (depth and breadth of the study) of the assessment needs to be ensured by setting clear and actionable requirements for example regarding scope, system boundaries and data quality (see also point 9).
6. **Transparency and reporting.** A transparent and comprehensive way of reporting needs to be ensured especially if results are communicated to third parties or intended to be used as a kind of 'comparative assertions disclosed to the public'.
7. **Access to report.** Free access to the report needs to be ensured to third parties to which results are communicated or those who could be affected by the results to allow for a proper evaluation of the report.
8. **Critical review.** A thorough critical review process needs to be put in place to ensure credibility and to verify that the requirements are met for methodology, data, interpretation and reporting, and whether a study is consistent with the principles provided in the standard. Specific requirements need to be put into place if results are intended to be used for communication to third parties or in 'comparative assertions disclosed to the public'.
9. **Generation of comparable data.** It must be ensured for the generation of comparable CF results that products are modelled in a comparable and consistent way. This is best done by setting up criteria and rules, comparable to the Product Category Rules (PCR) for environmental declarations in an EPD (ISO 14025). Relevant stakeholders have to be included in setting up the rules to ensure relevance and feasibility. Amongst others, the system of rules and criteria should comprise: setting comparable system boundaries, defining allocation methods, requirements regarding data quality related to age, regional and technological coverage, agreed rules on when to use generic data for background processes and when to use data specific to the product's supply chain, agreed data sources for generic background data, e.g. CF factors for electricity consumption and transport, as well as criteria for critical review and stakeholder engagement. Without detailed guidance and agreements on those aspects, any results will be associated with significant uncertainties. These uncertainties may render invalid product comparisons in which different parties have evaluated different products fulfilling the same service.

**We are looking forward to the readers' feedback on our thoughts.
The SETAC Europe LCA Steering Committee¹**

¹ The LCA community working within the Society of Environmental Toxicology and Chemistry (SETAC) has been instrumental in leading the discussions around the harmonization of different approaches to Life Cycle Assessment (LCA) in the early and mid nineties amongst others with the workshops leading to the SETAC LCA 'Code of Practice' (Sesimbra 1993). The SETAC work was fed as an important input into the development of the ISO guidelines on LCA released in their first version from 1997 to 2000 (ISO 14040–43). The ISO guidelines on LCA can be seen as a great success and have undergone their first revision in 2006 (ISO 14040/14044).